

**Notice of Allowability**

Application No.

10/812,538

Applicant(s)

GOLDSMITH, ROBERT L.

Examiner

Chester T. Barry

Art Unit

1724

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 5/13/04.
2. ☒ The allowed claim(s) is/are 1-9.
3. ☒ The drawings filed on 16 January 2004 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some\* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),  
Paper No./Mail Date 9/13/04, 8/20/04, 6/1/04, 5/25/04
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

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571-272-1152 direct  
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An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

IN THE TITLE

The title was changed from:

"AIRLIFT MEMBRANE DEVICE AND MEMBRANE BIOREACTOR AND  
BIOREACTOR PROCESS CONTAINING SAME "

to

-- BIOREACTOR PROCESS USING AN AIRLIFT MEMBRANE DEVICE  
AND MEMBRANE BIOREACTOR --.

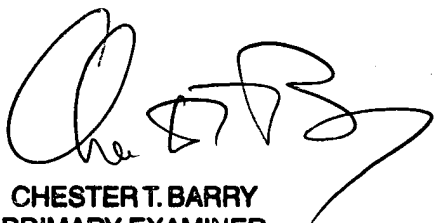
The following is an examiner's statement of reasons for allowance:

The prior art of record fails to describe or render obvious, within the meaning of 35 USC Sec. 103, a membrane bioreactor process comprising: performing a biological reaction within a bioreactor feed tank containing a liquid biomass feedstock; providing at least one airlift membrane device separating the feedstock into a retentate and a substantially biomass-free filtrate; the device having a bottom end face and a top end face and comprising a structure of at least one monolith of porous material, the monolith having a plurality of passageways extending longitudinally from the bottom end face to the top

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end face, the surface area of the passageway wall surfaces being at least 150 square meters per cubic meter of monolith volume, and the membrane device further containing at least one filtrate conduit for carrying filtrate from within the device toward a filtrate collection zone; the porous material having a porosity of at least 30% and a mean pore size of at least 3 microns, and a porous membrane having a mean pore size below about 1 micron applied to the passageway wall surfaces to provide a biomass separating membrane barrier; introducing the liquid feedstock into said airlift membrane device at the bottom end face and sparging gas below the bottom end face to provide airlift circulation of the feedstock through the membrane device; and separating the feedstock under an applied transmembrane pressure into filtrate removed to the filtrate collection zone and gas-containing retentate that passes through the top end face of the membrane device.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."



**CHESTER T. BARRY**  
**PRIMARY EXAMINER**

571-272-1152